

## Features

- Compact design, long life and high reliability
- Momentary switch
- Triple LED design
- Flatted and knurled shaft styles
- Bushing and bushingless options



## PEL12T - 12 mm Encoder with Switch and Illuminated Shaft

### Electrical Characteristics

Output.....	2-bit quadrature code
Closed Circuit Resistance .....	3 ohms maximum
Contact Rating.....	0.5 mA @ 5 VDC
Insulation Resistance .....	100 megohms @ 250 VDC
Dielectric Withstanding Voltage	
Sea Level.....	300 VAC minimum
Electrical Travel .....	Continuous
Contact Bounce (15 RPM).....	2.0 ms. maximum**
RPM (Operating) .....	100 maximum**

### Environmental Characteristics

Operating Temperature Range .....	-10 °C to +70 °C (+14 °F to +158 °F)
Storage Temperature Range .....	-40 °C to +85 °C (-40 °F to +185 °F)
Operating Humidity.....	25 % to 85 % R.H.
Rotational Life.....	30,000 cycles minimum
Switch Life .....	20,000 cycles minimum
IP Rating.....	IP 40

### Mechanical Characteristics

Mechanical Angle .....	360 ° continuous
Detent Torque .....	30 to 200 g-cm (0.42 to 2.77 oz.-in.)
Running Torque .....	50 g-cm (0.69 oz.-in.) maximum
Shaft Strength (Push).....	5 kgf (11.0 lbs.)
Shaft Strength (Pull) .....	10 kgf (22.0 lbs.)
Weight .....	3 gm (0.1 oz.) maximum
Terminals.....	Printed circuit board terminals
Soldering Condition	
Wave Soldering.....	Sn95.5/Ag2.8/Cu0.7 solder with no-clean flux: 260 °C max. for 5 ± 1 seconds
Hand Soldering .....	Not recommended
Hardware.....	One flat washer and one mounting nut supplied with each encoder with bushing

### Switch Characteristics

Switch Type .....	Contact Push ON Momentary SPST
Power Rating (Resistive Load) .....	10 mA at 5 V DC
Contact Resistance .....	100 milliohms
Switch Travel .....	0.5 +0.0/-0.3 mm
Switch Actuation Force .....	450 ± 200 gf (15.9 ± 7.0 oz.)

### How To Order

**PEL12T - 4 0 21 F - S 1 024**

Model \_\_\_\_\_

Terminal Configuration \_\_\_\_\_  
 4 = Horizontal Mount/Rear Exit PC Pin

Detent Option \_\_\_\_\_  
 0 = No Detents    1 = 12 Detents    2 = 24 Detents

Standard Shaft Length \_\_\_\_\_

Flatted:	Knurled:
16 = 16.0 mm	25 = 25.0 mm
18 = 18.5 mm	31 = 31.0 mm
21 = 21.0 mm	

Shaft Style \_\_\_\_\_  
 F = Insulated Flatted Shaft    S = Insulated Knurled Shaft (18 Teeth)  
 G = Insulated Flatted Shaft w/Bushing\*\*\*    T = Insulated Knurled Shaft (18 Teeth) w/Bushing

Switch Configuration \_\_\_\_\_  
 S = Push Momentary Switch

LED Color \_\_\_\_\_  
 Triple:  
 1 = Red/Green/Blue

Resolution \_\_\_\_\_  
 012 = 12 Pulses per 360 ° Rotation    024 = 24 Pulses per 360 ° Rotation

\*\*\* Available in 18.5, 21 and 26 mm shaft lengths.

\*RoHS Directive 2015/863, Mar 31, 2015 and Annex.

\*\*Devices are tested using standard noise reduction filters.

For optimum performance, designers should use noise reduction filters in their circuits.

Specifications are subject to change without notice. Users should verify actual device performance in their specific applications.

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**WARNING**  
**Cancer and Reproductive Harm**  
[www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

# Applications

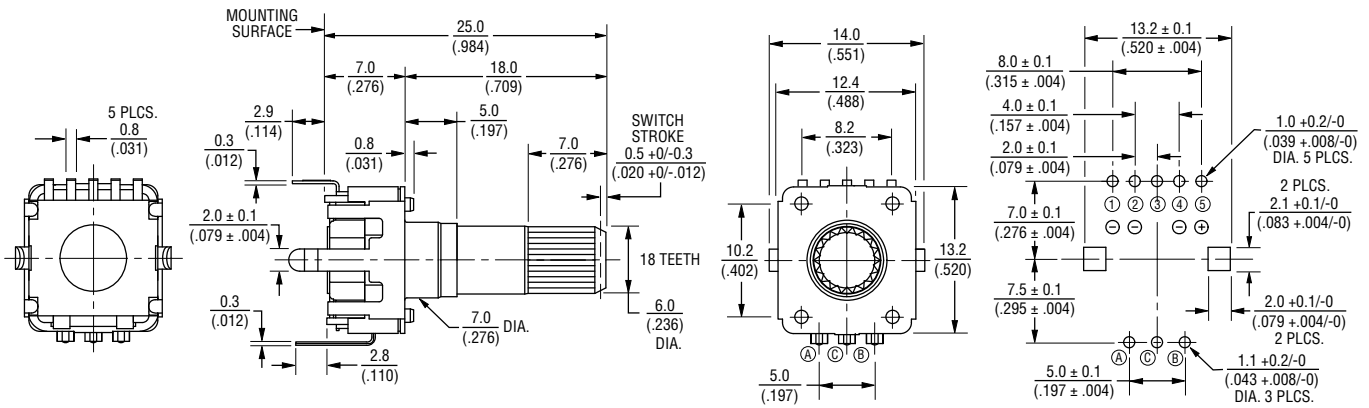
Level control, tuning and timer settings in:

- Audio-visual equipment
- Consumer electric appliances
- Musical instrumentation
- Communications equipment

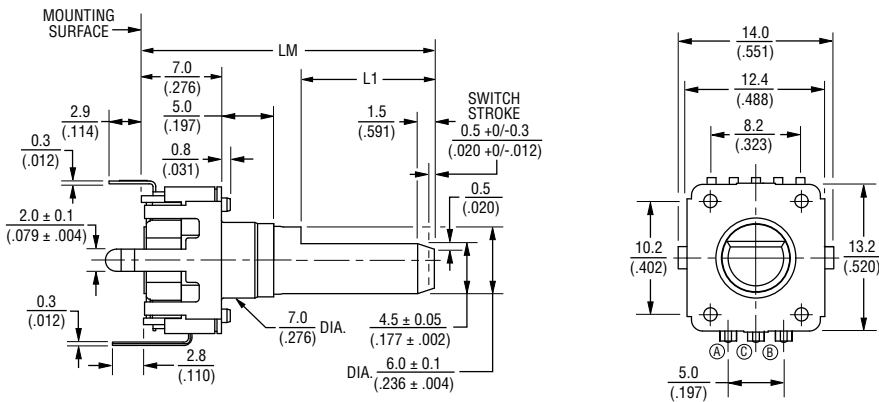
## PEL12T - 12 mm Encoder with Switch and Illuminated Shaft BOURNS®

### Product Dimensions

PEL12T-4xxxS-S1024 (Horizontal Mount w/Triple LED & Switch, Knurled Shaft)



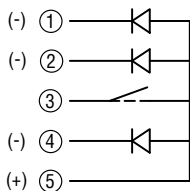
PEL12T-4xxxF-S1024 (Horizontal Mount w/Triple LED & Switch, Flatted Shaft)



L1	LM
$\frac{3}{(.118)}$	$\frac{16}{(.630)}$
$\frac{5}{(.197)}$	$\frac{18.5}{(.728)}$
$\frac{7}{(.276)}$	$\frac{21}{(.827)}$
$\frac{12}{(.472)}$	$\frac{26}{(1.024)}$
$\frac{12}{(.472)}$	$\frac{31}{(1.220)}$

DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

### Triple LED Circuit



TOLERANCES:  
 UNDER  $\frac{10.0}{(.394)} = \frac{\pm 0.3}{(\pm 0.12)}$   $\frac{10.0 - 100}{(.394 - 3.937)} = \frac{\pm 0.5}{(\pm 0.20)}$

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Users should verify actual device performance in their specific applications.

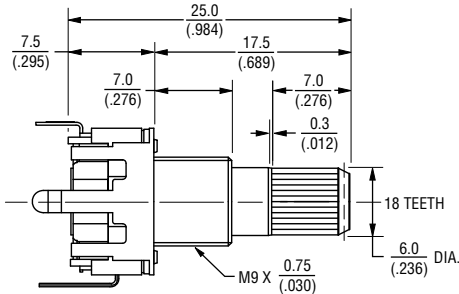
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# PEL12T - 12 mm Encoder with Switch and Illuminated Shaft

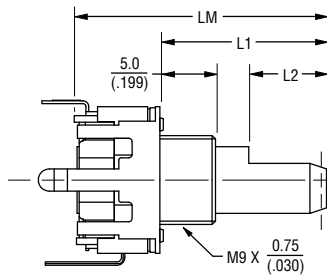


## Product Dimensions

PEL12T-4xxxT-S1024 (Horizontal Mount w/Triple LED & Switch, Knurled Shaft w/Bushing)



PEL12T-4xxxG-S1024 (Horizontal Mount w/Triple LED & Switch, Flatted Shaft w/Bushing)



L2	L1	LM
$\frac{5}{(.197)}$	$\frac{11}{(.433)}$	$\frac{18.5}{(.728)}$
$\frac{7}{(.276)}$	$\frac{13.5}{(.532)}$	$\frac{21}{(.827)}$
$\frac{12}{(.472)}$	$\frac{18.5}{(.728)}$	$\frac{26}{(1.024)}$

DIMENSIONS:  $\frac{\text{MM}}{(\text{INCHES})}$

TOLERANCES:  
 UNDER  $\frac{10.0}{(.394)} = \frac{\pm 0.3}{(\pm .012)}$      $\frac{10.0 - 100}{(.394 - 3.937)} = \frac{\pm 0.5}{(\pm .020)}$

## LED Characteristics (Triple)

LED Color	Power Dissipation (mW)	DC Forward Current (mA)	Forward Voltage (V)	
			Typ.	Max.
Red/Green/Blue	Red	25	2.0	2.4
	Green	25	3.3	3.7
	Blue	25	3.3	3.7

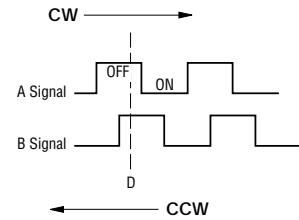
### Notes:

Reverse Current: 10  $\mu$ A  
 Reverse Voltage: 5 VDC  
 Test Condition (IF): 20 mA

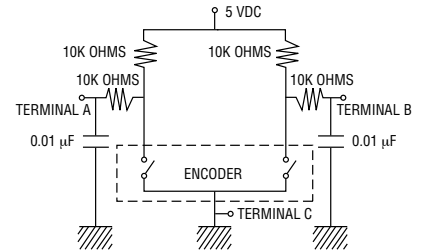
## LED Terminal Decoder

Code	Color	Terminals
1	Red / Green / Blue	① ⑤ / ② ⑥ / ④ ⑦

## Quadrature Output Table



## Suggested Filter Circuit



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